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PROGRAM INFORMATION BULLETIN NO. P12-07

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SUBJECT: Neutral Start Methods on Mobile Electrical Equipment

Who needs this information?
Mine Safety and Health Administration (MSHA) enforcement personnel, coal and metal and nonmetal surface and underground mine operators, miners' representatives, equipment manufacturers, and repair shop facilities.

What is the purpose of this Program Information Bulletin (PIB)?
The purpose of this PIB is to inform interested parties of a potential hazard that can be eliminated by providing a neutral start method on mobile electrical equipment. This PIB supersedes P09-07.

Information
What is a neutral start method?
A neutral start method is a design feature which ensures that machines cannot be started unless the drive (tram) control is in neutral. This ensures that motor torque will not be transmitted unintentionally to the drive motors and cause machine movement when electrical power circuits are energized on the machine. A neutral start method also prevents electrical equipment from changing direction with the foot control

depressed and when the directional control is switched from one direction to the other (directional control interlock feature) until the foot control is released to the neutral position.

Why is a neutral start method needed?

The lack of a neutral start method can create a dangerous condition for persons working in the vicinity of equipment, who might be caught unaware by the sudden movement of the equipment when the equipment becomes energized. Without a neutral start feature, it is possible to start a machine and deliver power to the driving mechanism resulting in unintentional movement of the machine or enabling the machine to change direction with the foot control depressed before the equipment operator is in total control of the machine. This hazard applies to machines with direct-drive electric motors, as well as machines utilizing fluid power or other systems for the drive mechanism. For this reason, MSHA recommends that mine operators and equipment manufacturers equip all mobile electrical motor-driven machines with a neutral start feature as soon as possible. For further guidance on equipment modification, contact the equipment manufacturer. If the equipment being modified is permissible, the approval holder or mine operator should contact MSHA's Approval and Certification Center to ascertain whether the equipment modification affects the permissibility of such equipment.

What is the background for this PIB?

An accident occurred while a shift foreman was preparing to tram a belt feeder after a belt move. When the feeder was energized, it started the driving mechanism, which caused unintentional and uncontrolled machine movement, resulting in the machine pivoting abruptly and pinning the victim between the feeder and the coal rib.

Another accident occurred when a mantrip was traveling in reverse and became stuck on a pile of coal. The foot control remained depressed and the machine operator changed the directional control switch to forward. The mantrip lunged forward and pinned a miner against the coal rib. These accidents and other similar accidents could have been prevented if the machine involved had incorporated a neutral start feature.

The incorporation of a neutral start feature will have a minimal impact on retrofitting electrical equipment in the field. Neutral start features have been successfully incorporated into underground permissible diesel-powered equipment for over 25 years and should also be incorporated into other mobile electrical equipment. Several manufacturers already have incorporated electrical circuits to prevent tramming of equipment if a directional control or footswitch is activated unintentionally during start-up. Other pieces of equipment have incorporated circuits to prevent a hydraulic motor from starting, unless the directional control for the electric tram motors is placed in the "off" or "neutral" position when the hydraulic motor is energized. Additionally, it is possible to devise a neutral start feature through a mechanical linkage which would prevent the ability to start the machine unless the tram controls are placed in a "neutral" position.

What is MSHA's Authority for this PIB?
The Federal Mine Safety and Health Act of 1977, as amended, 30 U.S.C. § 801 et seq., 30 C.F.R. §§ 18.20(b), 56.14100, 57.22302, 57.22303, 57.22304, 57.22305, 75.1725, and 77.404.

Is this PIB on the Internet?
This bulletin may be viewed on the Internet by accessing MSHA's home page (http://www.msha.gov) and then choosing "Compliance Info" and then clicking on "Program Information Bulletins."

Who are the contact persons for this PIB?
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Who will receive this PIB?
MSHA Program Policy Manual Holders
MSHA Special Interest Groups
Surface and Underground Coal and Metal and Nonmetal Mine Operators
Repair Shops
Manufacturers of Electric Mining Equipment